



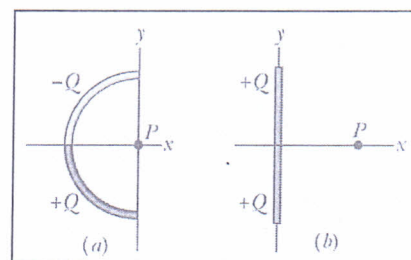
Name: group: Mark

(شكل وتنظيم الورقة له اعتبار فى التقييم)

- (1) Find the velocity of light in a medium having refractive index $n=1.5$. (2 marks)
- (2) Write a short discussion on electromagnetic spectrum, which end of the spectrum is more energetic? Why? (3 marks)
- (3) What is the smallest separation between two slits that will produce a second-order maximum for 700-nm light? (3 marks)
- (4) Discuss the characteristics of a single slit diffraction pattern. (4 marks)
- (5) Two non-conducting rods, one circular and one straight. Each has a uniform charge of magnitude Q along its top half and another along its bottom half. For each rod, what is the direction of the net electric field at point P ? (4 marks)

(a)

(b)



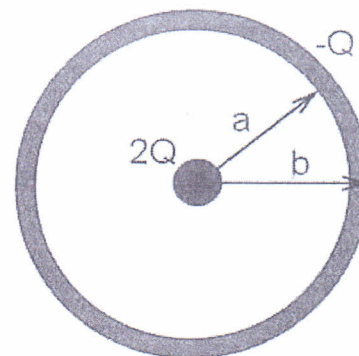
- (6) A spherical conducting shell has charge $-Q$. A particle with charge $2Q$ is placed at the center of the shell as shown. (5 marks)

(a) Find the electric field at:

i) $r < a$ $E =$

ii) $r > b$ $E =$

iii) $a < r < b$ $E =$



(b) Sketch the electric field lines for this set of charges.



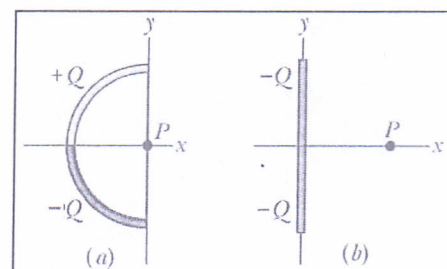
Name: group: Mark

(شكل وتنظيم الورقة له اعتبار فى التقييم)

- (1) Find the velocity of light in a medium having refractive index $n=2$. (2 marks)
- (2) Write a short discussion on electromagnetic spectrum, which end of the spectrum is less energetic? Why? (3 marks)
- (3) What is the smallest separation between two slits that will produce a second-order maximum for 600-nm light? (3 marks)
- (4) Discuss the characteristics of a single slit diffraction pattern. (4 marks)
- (5) Two non-conducting rods, one circular and one straight. Each has a uniform charge of magnitude Q along its top half and another along its bottom half. For each rod, what is the direction of the net electric field at point P ? (4 marks)

(a)

(b)



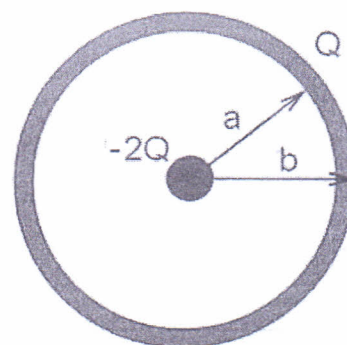
- (6) A spherical conducting shell has charge Q . A particle with charge $-2Q$ is placed at the center of the shell as shown. (5 marks)

(a) Find the electric field at:

i) $r < a$ $E =$

ii) $r > b$ $E =$

iii) $a < r < b$ $E =$



(b) Sketch the electric field lines for this set of charges.